

SECTION III—REMARKS

This amendment is submitted in response to the Office Action mailed December 8, 2005. Claims 1, 3-7, 11, 14-18, 22-23, 26-30 and 34 are amended and claims 2, 12 and 24 are cancelled. Claims 1, 3-11, 13-23 and 25-34 remain pending in the application. Applicants respectfully request reconsideration of the application and allowance of all pending claims in view of the above amendments and the following remarks.

Rejections Under 35 U.S.C. § 112

The Examiner rejected claims 1-29 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and claim the subject matter the Applicants regard as the invention. Applicants respectfully traverse the Examiner's rejections. Definiteness of claim language cannot be analyzed in a vacuum, but must instead be analyzed in light of the disclosure, the teachings of the prior art, and the interpretation that would be given by one possessing ordinary skill in the pertinent art. MPEP § 2173.02. As explained below, Applicants submit that, when interpreted in light of the disclosure and the prior art, one of ordinary skill in the art would understand the meaning of the terms alleged to be indefinite.

First, the Examiner alleges that the term "nanoclay" in claims 1-3, 11-13, 22-25 and 34 is unclear. According to the Examiner, a "nanocomposite" is used in the literature for particle-filled polymers in which at least one of the dimensions of the dispersed particles is in the nanometer range, and "clay" can be virtually any fine inorganic powder. The Examiner thus interprets the term "nanoclay" to mean an inorganic powder consisting of particles having at least one dimension in the nanometer range. Applicants respectfully disagree with the Examiner's interpretation of the term "nanoclay." The term "nanoclay"

is understood in the art to include natural or synthetic materials or combination of materials that are clay or clay-like and have at least one dimension on the nanometer order of magnitude. Applicants respectfully direct the Examiner's attention to the specification at page 8, line 11, where several embodiments of nanoclays are listed.

Next, the Examiner alleges that the term "aspect ratio" used in claims 1-3, 11-13, 22-25 and 34 is unclear. According to the Examiner, aspect ratio has no well-defined meaning for a three-dimensional object. Applicants have amended the claims to recite "platelets" instead of "particles," and Applicants respectfully direct the Examiner's attention to the specification at page 5, lines 8-11, where the aspect ratio of a platelet is discussed. Applicants submit that these amendments to the claims overcome the Examiner's rejections.

Next, the Examiner alleges that the relative term "high" used in claims 1, 11, 22-23 and 34 has no well-recognized meaning and therefore makes the subject matter of the claim indefinite. Applicants have amended claims 1, 11, 22-23 and 34 to remove the term "high." Applicants submit that this overcomes the Examiner's rejections.

Finally, the Examiner alleges that the term "about" used in claims 2-3, 12-13 and 24-25 is vague and unclear and leaves the reader in doubt as to the meaning of the technical terms to which it refers, thus rendering the subject matter of the claims unclear. Applicants respectfully disagree. The fact that claim language, including terms of degree such as "about," may not be precise, does not automatically render the claim indefinite under 35 U.S.C. § 112, second paragraph. *See* MPEP § 2173.05(b); *Seattle Box Co., v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 221 USPQ 568 (Fed. Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art

would understand what is claimed in light of the specification. A term such as “about” is permitted when used exactly as it is in these claims: the term “about” refers to the aspect ratio of the nanoclay platelets, and one of ordinary skill in the art would clearly understand what this means when considered in view of the specification.

Rejections Under 35 U.S.C. § 102

The Examiner rejected claims 1, 4 and 10 as anticipated under 35 U.S.C. § 102(b) by U.S. Patent Application Publication No. 2003/0030999 to Satsu *et al.* (“*Satsu*”) and also rejected claims 1, 5-9, 11, 15-19 and 22 as anticipated under 35 U.S.C. § 102(b) by U.S. Patent Application Publication No. 2004/0025743 to Wakizaka *et al.* (“*Wakizaka*”). Applicants respectfully traverse the Examiner’s rejections. A claim is anticipated only if each and every element, as set forth in the claim, is found in a single prior-art reference. MPEP § 2131; *Verdegaal Bros. v. Union Oil of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). As explained below, *Satsu* and *Wakizaka* cannot anticipate these claims because neither discloses every element and limitation recited therein.

Claim 1 was rejected as anticipated by both *Satsu* and *Wakizaka*. As amended, claim 1 recites a combination including a substrate including a plurality of conducting layers and a nanocomposite inter-layer dielectric (ILD) sandwiched between the conducting layers, wherein the nanocomposite ILD layer comprises a nanocomposite including a polymer having “a plurality of nanoclay platelets dispersed therein, the nanoclay platelets having an aspect ratio equal to or greater than about 50.” *Satsu* discloses a high dielectric constant material comprising an organic resin having dispersed therein an inorganic filler that includes a metal powder as an essential component (paragraph [0031]). *Satsu* includes no disclosure, teaching or suggestion regarding the use

of nanoclays in a nanocomposite. Moreover, *Satsu* does not disclose, teach or suggest that the particles in the nanocomposite should be platelets, nor does it disclose that any of the particles should have a dimension in order of magnitude of a nanometer. *Satsu* therefore cannot disclose, teach or suggest a combination including “a plurality of nanoclay platelets dispersed therein, the nanoclay platelets having an aspect ratio equal to or greater than about 50,” and thus *Satsu* cannot anticipate the claim.

Wakizaka discloses a curable composition including flame retardants having a particulate form (paragraph [0112]). The particles are generally whisker- or needle-like in shape (paragraph [0068]), have an average major axis from 0.01 to 5 μm , preferably from 0.03 to 3 μm , and have an aspect ratio (average major axis/average minor axis) of 5 or less, preferably 3 or less (paragraph [0113]). *Wakizaka* therefore cannot disclose, teach or suggest a combination including “a plurality of nanoclay platelets dispersed therein, the nanoclay platelets having an aspect ratio equal to or greater than about 50” because it discloses that the particles are whisker-like or needle-like instead of being platelets. *Wakizaka* also discloses that the particles have dimensions several orders of magnitude larger than nanoclays and have aspect ratios at least one order of magnitude smaller. Applicants submit that *Wakizaka* therefore cannot disclose, teach or suggest a combination including the recited limitations and respectfully request withdrawal of the rejection and allowance of the claim.

Regarding claims 4-10, if an independent claim is allowable, then any claim depending therefrom is also allowable. MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 1 is in condition for allowance. Applicants respectfully submit that claims 4-10 are therefore allowable by virtue of their dependence

on an allowable independent claim, as well as by virtue of the features recited therein. Applicants therefore respectfully request withdrawal of the rejections and allowance of these claims.

Claim 11 was rejected as anticipated by *Wakizaka*. As amended, claim 11 recites a combination including a substrate having a contact surface and a nanocomposite solder resist layer placed on the contact surface, wherein the solder resist comprises a nanocomposite including a polymer binder having “a plurality of nanoclay platelets dispersed therein, the nanoclay platelets having an aspect ratio greater than about 50.” By analogy to the discussion above regarding the application of *Wakizaka* to claim 1, Applicants submit that *Wakizaka* cannot anticipate the claim because it does not disclose, teach or suggest every element and limitation of the claim. Applicants therefore respectfully request withdrawal of the rejection and allowance of the claim.

Regarding claims 15-19 and 22, if an independent claim is allowable, then any claim depending therefrom is also allowable. MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 11 is in condition for allowance. Applicants respectfully submit that claims 15-19 and 22 are therefore allowable by virtue of their dependence on an allowable independent claim, as well as by virtue of the features recited therein. Applicants therefore respectfully request withdrawal of the rejections and allowance of these claims.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 2-3, 12-14, 20-21 and 23-34 under 35 U.S.C § 103(a) as obvious in view of, and therefore unpatentable over, various combinations of the following references: *Satsu*, *Wakizaka*, and European Patent Application No. EP-A-

0873047 to Kobayashi *et al.* (“*Kobayashi*”). Specifically, the Examiner rejected claims 14, 20, 21, 23 and 26-34 as unpatentable over *Satsu* in view of *Wakizaka* and rejected claims 2-3, 12-13 and 24-25 as unpatentable over *Satsu* in view of *Wakizaka* and further in view of *Kobayashi*.

As to claims 3, 13-14 and 20-21, if an independent claim is allowable, then any claim depending therefrom is also allowable. *See generally* MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claims 1 and 11, as amended, are in condition for allowance. Applicants respectfully submit that claim 3 is therefore allowable by virtue of its dependence on allowable claim 1, as well as by virtue of the features recited therein. Similarly, claims 13-14 and 20-21 are allowable by virtue of their dependence on allowable claim 11, as well as by virtue of the features cited therein. Applicants therefore respectfully request withdrawal of the rejections and allowance of these claims.

As to claim 23, Applicants respectfully traverse the Examiner’s rejections. To establish a *prima facie* case of obviousness, three criteria must be met: (1) the prior art references must teach or suggest all the claim limitations; (2) some suggestion or motivation to combine the references must be found in the prior art; and (3) there must be a reasonable expectation of success. MPEP § 2143. As explained below, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness.

Claim 23 was rejected as obvious over *Satsu* in view of *Wakizaka*. As amended, claim 23 recites a system combination including a substrate having a contact surface, a nanocomposite solder resist layer placed on the contact surface, wherein the solder resist comprises a nanocomposite including a polymer binder having “a plurality of nanoclay

platelets dispersed therein, the nanoclay platelets having an aspect ratio equal to or greater than about 50.” As discussed above in connection with claim 1, *Satsu* does not disclose, teach or suggest a combination including “a nanocomposite including a polymer binder having “a plurality of nanoclay platelets dispersed therein, the nanoclay platelets having an aspect ratio equal to or greater than about 50.” *Wakizaka* similarly does not disclose, teach or suggest a combination including the claimed limitation, meaning that the combination of *Satsu* and *Wakizaka* cannot obviate the claim. Applicants therefore respectfully request withdrawal of the rejection and allowance of the claim.

Regarding claims 25-34, if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is also non-obvious. MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 23 is in condition for allowance. Applicant respectfully submits that claims 25-34 are therefore allowable by virtue of their dependence on an allowable independent claim, as well as by virtue of the features recited therein. Applicant therefore respectfully requests withdrawal of the rejections and allowance of these claims.

Conclusion

Given the above amendments and accompanying remarks, all claims pending in the application are in condition for allowance. If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to allowance of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 292-8600.

Charge Deposit Account

Please charge our Deposit Account No. 02-2666 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

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Date: 4-6-06



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